Blood-borne Pathogens: Controlling Workers' Compensation Costs Through Optimization of Your Blood-borne Pathogen Exposure Program

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Presentation Objectives

- Become familiar with the important program elements of a successful occupational bloodborne pathogen exposure control program
- Understand how having a successful bloodborne pathogen exposure control program can impact workers compensation claims/costs
- Learn about resources available to help implement a successful program

BACKGROUND ON THE NEED FOR AN EFFECTIVE BLOODBORNE PATHOGEN PROGRAM (BBP)

- Each year 385,000 needlesticks and other sharps-related injuries are sustained by hospital-based healthcare personnel (CDC).
- Surveys of healthcare personnel indicate that 50% or more do not report their occupational percutaneous injuries (CDC) .
- Program focuses on HIV, Hepatitis B, and Hepatitis C which can cause significant morbidity and even death if contracted by a health care worker (HCW)

BACKGROUND ON THE NEED FOR AN EFFECTIVE BBP PROGRAM: HEPATITIS B

- Hepatitis B: 12,000 cases in healthcare workers occupationally acquired in 1985 vs. 500 in 1997 (decrease due to Hep B vaccination)
- 6-30% transmission rate in a susceptible healthcare worker not given post-exposure prophylaxis

BACKGROUND ON THE NEED FOR AN EFFECTIVE BBP PROGRAM: HIV

- HIV: Through 12/2001 there has been approximately 57 documented cases (138 possible cases) of health care workers contracting HIV occupationally
- 0.3% transmission rate after a percutaneous exposure
- 0.09% transmission rate after mucous membrane exposure
- There has been episodes of HIV transmission after skin exposure, but risk is estimated to be less than with mucous membrane exposure

BACKGROUND ON THE NEED FOR AN EFFECTIVE BBP PROGRAM: Hepatitis C

- There are 3.9 million Americans with HCV
- 8-10,000 deaths annually due to HCV
- Estimated annual treatment costs $600 million
- Chronic HCV infection is the most common indicator for orthotopic liver transplantation in the US

BACKGROUND ON THE NEED FOR AN EFFECTIVE BBP PROGRAM: Hepatitis C

- The exact number of healthcare personnel who acquire HCV occupationally is not known
- Healthcare personnel exposed to blood make up 2-4% of the annual total new HCV infections
- Total number of new infections has declined from 112,000 in 1991 to 38,000 in 1997
- Estimated average risk of transmission following percutaneous exposure from a positive HCV source is 1.8%

BACKGROUND ON THE NEED FOR AN EFFECTIVE BBP PROGRAM: Hepatitis C

- Percutaneous exposure the most common and effective transmission route
- One case report documenting transmission via splash to the conjunctiva
- No report of transmission through “intact skin”; one case report possibly showing transmission through “non-intact” skin

BACKGROUND ON THE NEED FOR AN EFFECTIVE BLOODBORNE PATHOGEN PROGRAM (BBP)

- However, there are a multitude of other hazardous pathogens HCWs can be potentially exposed too.

Table 1. Infections Transmitted via Sharps Injuries during Patient Care (PC) and/or Laboratory/Autopsy (LA)

Infection	PC	L/A
Blastomycosis		⊛
Cryptococcosis		⊛
Diphtheria		⊛
Ebola		⊛
Gonorrhea		⊛
Hepatitis B	⊛	⊛
Hepatitis C	⊛	⊛
HIV	⊛	⊛
Herpes	⊛	
Leptospirosis		⊛
Malaria	⊛	
M. tuberculosis	⊛	⊛
Rocky Mountain spotted fever		⊛
Scrub typhus		⊛
Strep pyogenes		⊛
Syphilis		⊛
Toxoplasmosis		⊛

References 2,3,8-10

http://www.cdc.gov/sharpssafety/workbook.html

Accrediting Organizations, Federal/State Agencies, Federal/State Statutes Involved with Sharps Injury Prevention

- **Joint Commission on Accreditation of Healthcare Organizations (JCAHO)** standards for surveillance of infection, environment of care, and product evaluation;
- **Center for Medicare and Medicaid Services (CMS)** compliance with the *Conditions for Medicare and Medicaid Participation*;

Accrediting Organizations, Federal/State Agencies, Federal/State Statutes Involved with Sharps Injury Preventions

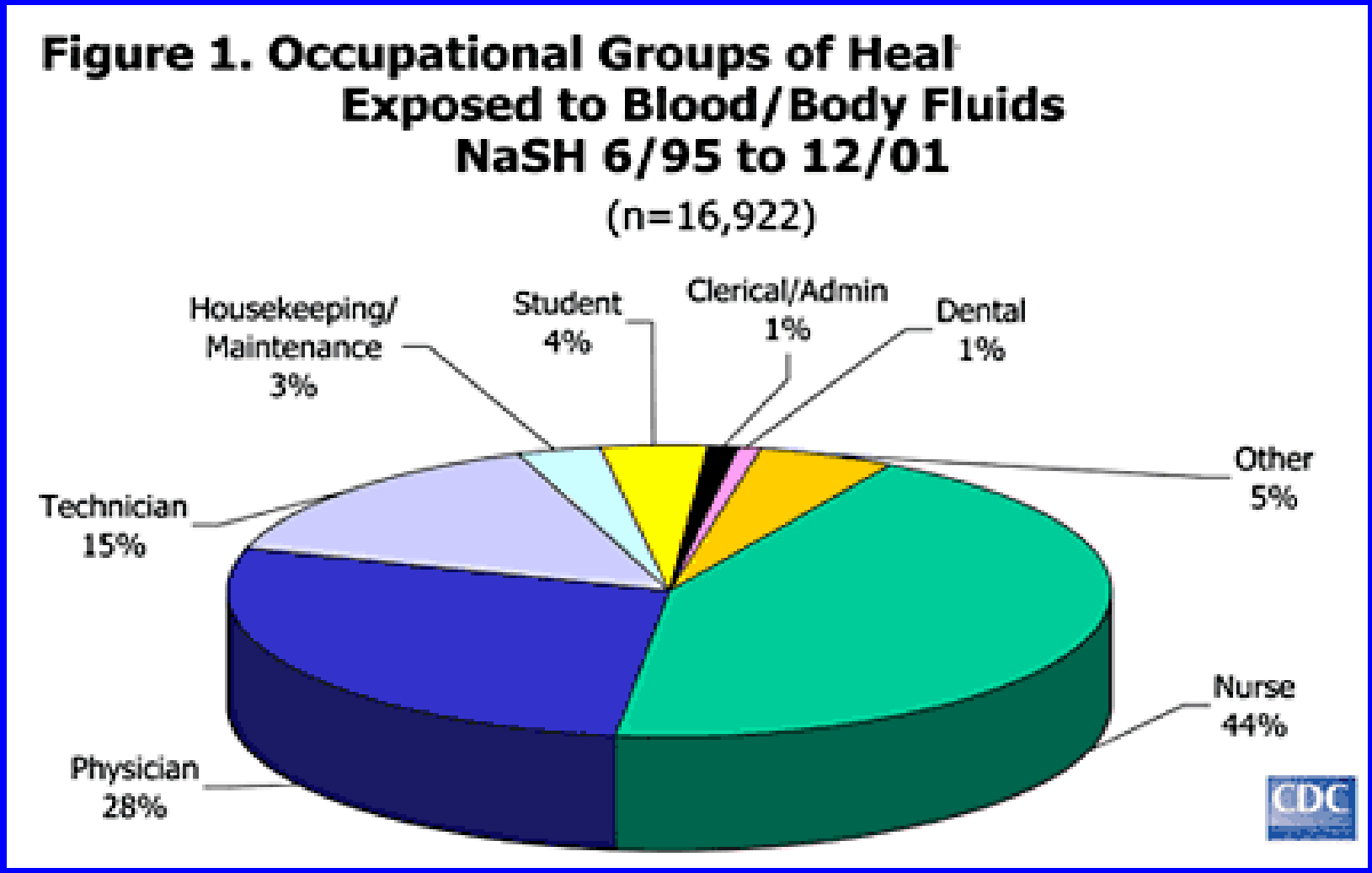
- **Occupational Safety and Health Administration (OSHA)** Bloodborne Pathogens Standard (29 CFR 1910.1030) and its related field directive, *Inspection Procedures for the Occupational Exposure to Bloodborne Pathogens Standard* (CPL 2-2.44, November 5, 1999) requiring use of engineered sharps injury prevention devices as a primary prevention strategy

Accrediting Organizations, Federal/State Agencies, Federal/State Statutes Involved with Sharps Injury Preventions

- **State OSHA plans** that equal or exceed federal OSHA standards for preventing transmission of bloodborne pathogens to healthcare personnel;
- **State-specific legislation** that also requires the use of devices with engineered sharps injury prevention features and, in some cases, specific sharps injury reporting requirements

Accrediting Organizations, Federal/State Agencies, Federal/State Statutes Involved with Sharps Injury Preventions

- **Federal Needlestick Safety and Prevention Act** (PL 106-430), (November 6, 2000), which mandates revision of the 1991 OSHA Bloodborne Pathogens Standard to require the use of engineered sharps injury prevention devices.



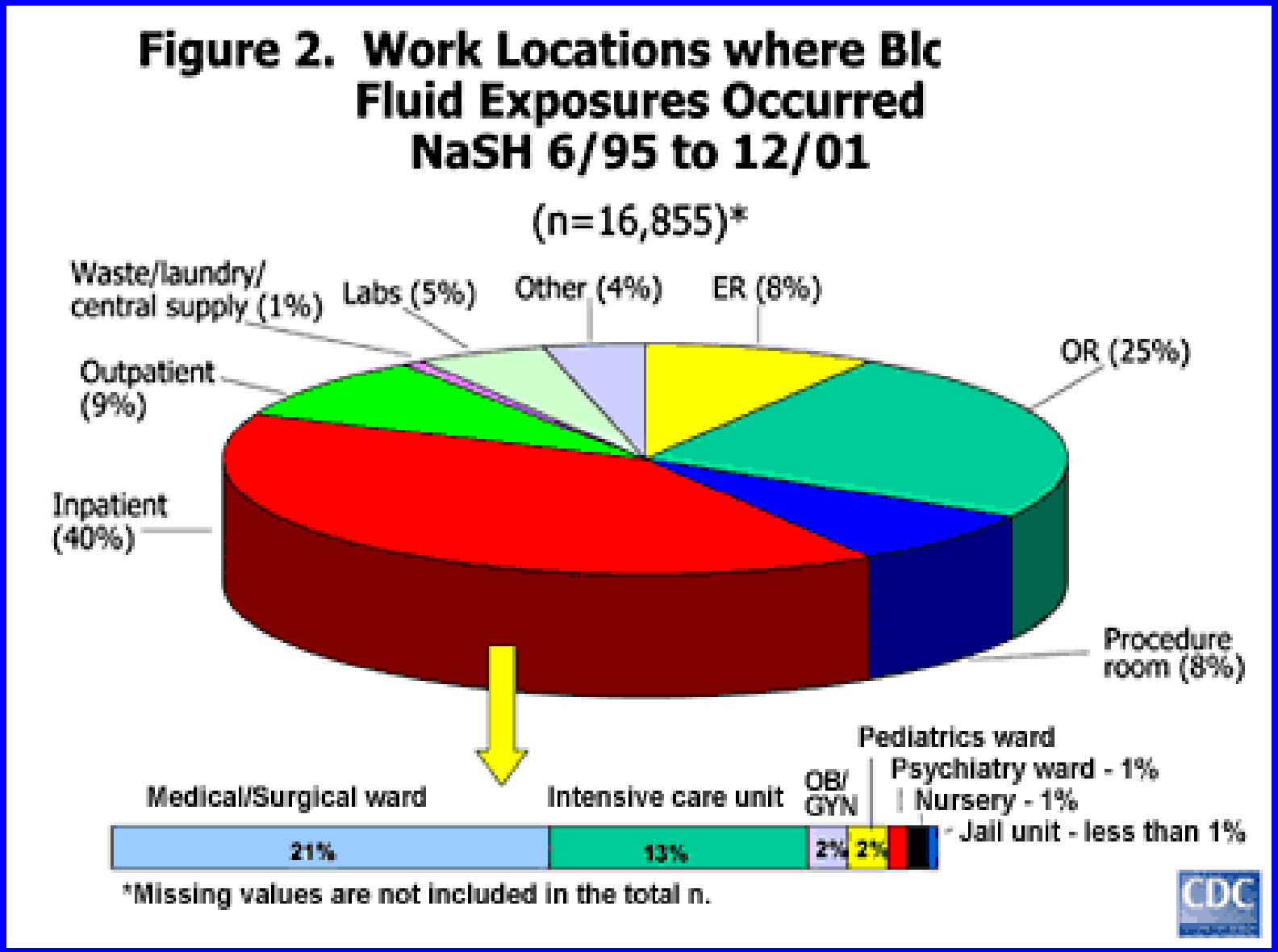
http://www.cdc.gov/sharpssafety/workbook.html

Table 2. Comparison of the Proportions and Rates of Percutaneous Injuries among Selected Occupations in Reported Studies

Author/Study Period	Nurses	Laboratory	Physicians*	Housekeeping
McCormick & Maki (1987-88) *(48)*	58% 20	9% 17	23%* 15	11% 31/100 Employees
Ruben et al. (1977-80) *(49)*	66% 23	10% 12	4% 5	16% 18/100 Employees
Mansour (1984-89) *(50)*	62% 10	21% 20	7% 2	10% 6/100 FTE
Whitby et al. (1987-88) *(51)*	79% 15	2% 4	11% 3	5% 3/100 Employees

* Denotes house staff only. The employee/employer relationship with the healthcare organization affects injury rates among physicians.

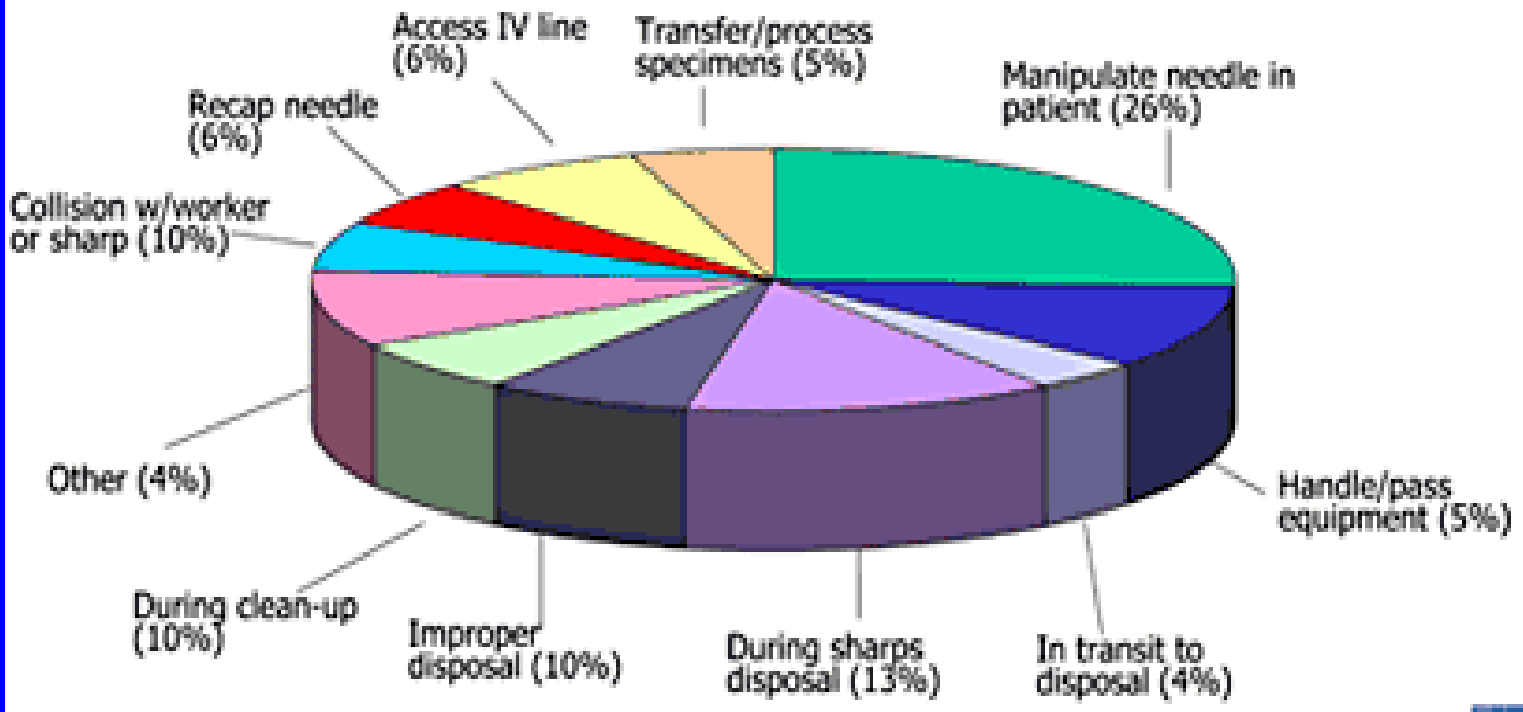
http://www.cdc.gov/sharpssafety/workbook.html



http://www.cdc.gov/sharpssafety/workbook.html

Figure 3. Circumstances Associated Hollow-Bore Needle Injuries NaSH 6/95 to 12/01

(n = 8,225)*



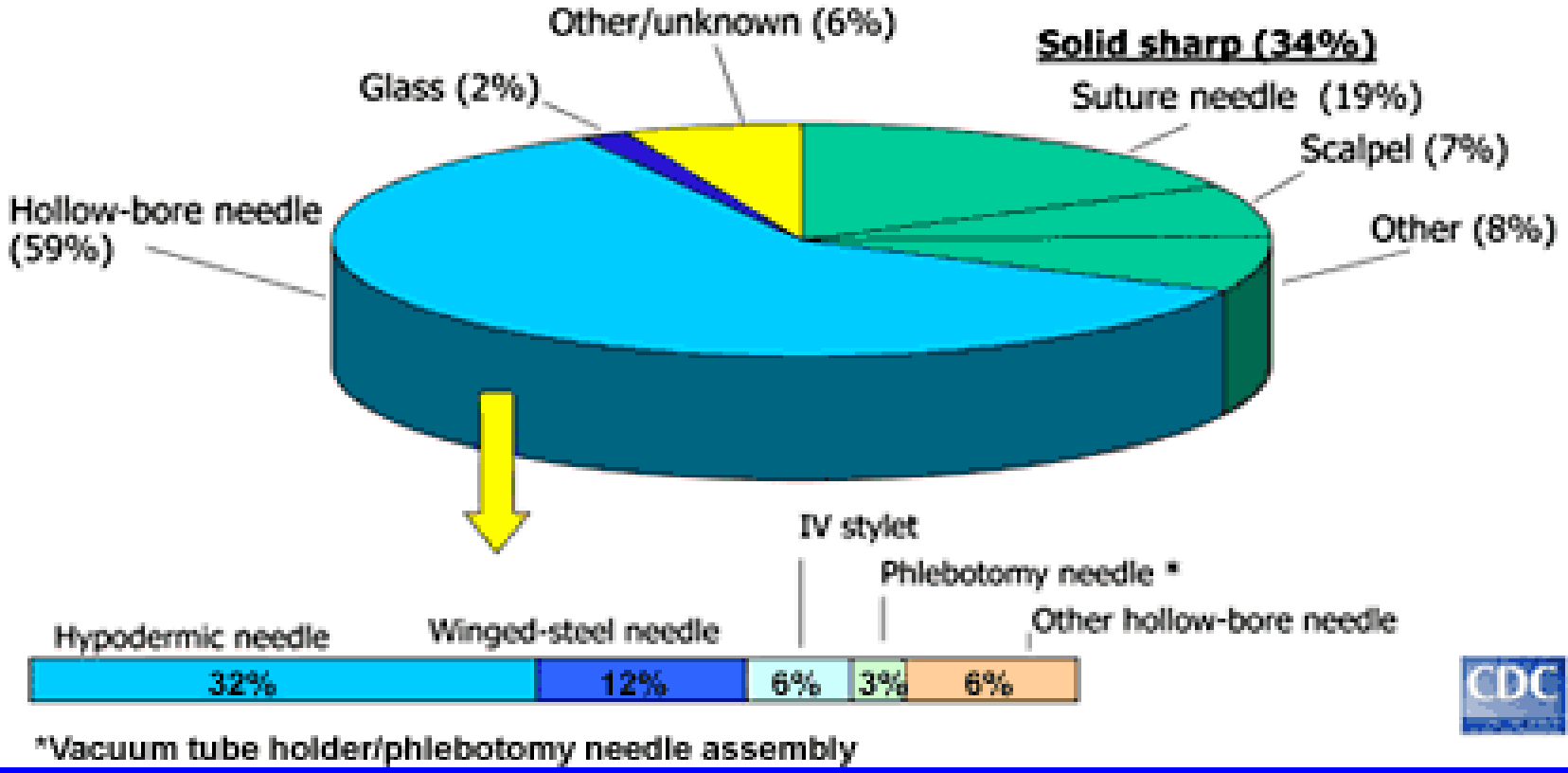
*435 records are missing how the injury occurred.

CDC

http://www.cdc.gov/sharpssafety/workbook.html

Figure 4. Devices Involved in Percutaneous Injuries

(n=13,731)



*Vacuum tube holder/phlebotomy needle assembly

http://www.cdc.gov/sharpssafety/workbook.html

Bloodborne Pathogen Exposure Incident Costs

- Physician visit, follow-ups, lab tests, lost work time cost anywhere from $500-$3000 dollars (CDC)
- CDC Sharps Injury Prevention Workbook Appendix allows one to estimate the costs in ones own organization
- Costs are an important performance metric and advocacy tool in obtaining resources to run the program optimally

Bloodborne Pathogen Exposure Incident Costs: Long Term Costs Of Positive Cases

- HIV
  - Medications cost $10-20,000 dollars per year
- Hepatitis B
  - Liver transplant
  - Medication costs (interferon, lamivudine, adefovir)
- Hepatitis C
  - Currently, chronic hepatitis C is the most common indication for orthotopic liver transplantation in the United States.
  - Liver transplant costs over a million dollars when factoring together the surgery and lifelong immunosuppressant medication

BBP Exposure Control Program Elements

- Immunization
- Sharps injury prevention
- Injury care/Post exposure prophylaxis/Follow-up

Immunization

- All HCWs with the reasonable potential for exposure to blood should be offered the Hepatitis B vaccination
- 3 shot series
- All HCWs should have serologic testing confirming immunity 1-2 months after last dose.
- An anti-HBS $\geq$ 10mIU/ml indicates immunity

— Needle Tips Oct 2003; www.immunize.org

Immunization

- If doses are delayed, complete the series vs. starting over
- Repeat the series once if the anti-HBS test is negative or borderline
  - If the test remains negative or borderline after the second series, do not give a person a third series and counsel appropriately
- No further testing is required once a positive anti-HBS is documented

•Needle Tips Oct 2003; www.immunize.org

Immunization

- No booster doses are needed even if a subsequent test in a documented positive anti-HBS patient is negative (immune memory phenomena)
- If a HCW states they had the HEP B vaccination series but it is not documented, the full series should be readministered
- If a series is documented, but no titer was drawn at the appropriate time, a titer should be drawn only if the patient is exposed.

•Needle Tips Oct 2003; www.immunize.or

Immunization

- If a HCW still tests negative after 2 series, post exposure prophylaxis should be the HBIG x 2
- There are no regulations that require the removal of HCW from their jobs if they are non-immune responders to the vaccine
- Similarly HBV positive persons are not excluded from working as HCW
  - Needle Tips Oct 2003; www.immunize.org

Injury Care/Post Exposure Prophylaxis/Follow-up

- The need to initiate HIV prophylaxis medication within a 2 hour window is the driving force behind who provides initial care/assessment to occupational needlestick cases
- At NNMC, Occupational Health provides care during regular working hours while ER is in charge after hours and on weekends. F/U done in Occ Health
- At NMC San Diego, the pharmacy does the initial assessment and provides the prophylactic medication. F/U done in Occ Health
- Using the Nurse of the Day (NOD) might be another possibility

Injury Care/Post Exposure Prophylaxis/Follow-up

- At NNMC, if there is a need for HIV prophylaxis, the OH MD can prescribe or the ID fellow
  - Drug regimen used at NNMC
    - Low risk-Combivir
    - High risk-Add nelfinavir (better side effects profile than Indinavir)
- Most common reason to give HIV medications is that test results on source patient not available in a timely manner
  - Less of a problem with the availability of the Oraquick Rapid HIV test
- Hepatitis B prophylaxis you have up to a week to initiate, although the sooner the better still applies

Oraquick Rapid HIV Test

- OraQuick® is an FDA approved rapid point-of-care fingerstick and venipuncture whole blood test used to aid in the diagnosis of HIV-1 infection.
- This CLIA waived test, which detects the presence of antibodies to HIV-1, requires only a drop of blood and can produce results in 20 minutes.

Oraquick Rapid HIV Test

How It Works

1. Collect

Touch the specimen collection loop to the fingerstick blood droplet.

OR

Use standard phlebotomy collection procedures for whole blood with the following test tubes:
EDTA, Sodium Heparin, Sodium Citrate or ACD Solution and dip loop into test tube.

2. Mix
Use the loop to stir the specimen in the vial of developer solution.

3. Read
Insert the device and read the results after 20 minutes.

Negative Test Result

Positive Test Result

Injury Care/Post Exposure Prophylaxis/Follow-up

- Close follow-up of all patients is key for proper execution of the exposure program
- For medico-legal purposes have to show that you aggressively pursued contacting the patient to have their follow-up
- Good documentation of visits, lab results, and appointment reminders is very important
  - At NNMC, a comprehensive pre-printed form developed by NMCSD is utilized to document incidents and the requisite follow-up

BLOOD BORNE PATHOGEN EXPOSURE GUIDELINES
OCCUPATIONAL HEALTH CLINIC
NATIONAL NAVAL MEDICAL CENTER-BETHESDA, MD

GUIDELINES FOR BBP EXPOSURES

1. Anyone (active duty, civilian, or contractor) incurring an exposure to blood/body fluids will wash or flush the area for at least 5 minutes, and then report the exposure immediately to their supervisor. The exposed individual is to then go to the Occupational Health Clinic (Mon-Fri; 0700-1530) or the ER (if the exposure occurs after hours or on the weekends). Those patients that report to the ER initially should follow-up at the Occupational Health Clinic on the next day (during regular business hours). If the source of the exposure is known, that person should be contacted and advised to get their blood drawn for testing on an urgent basis.
2. The treating physician will perform an initial screening of the exposure incident to determine if the "source" is known to be HIV positive. **This should be done within 15 minutes of the exposure.**
3. If the "source" is known to be HIV positive, the treating physician will contact the Infectious Disease Watch, notify them of the exposure and arrange a time for the exposed individual to be seen ASAP. If a delay in prescribing of HIV prophylaxis is anticipated, the treating physician, at their discretion, may prescribe a 24-hour dose of a two or three antiviral drug regimen (per Public Health guidelines). If the individual is pregnant, the OB resident will also be notified.
4. If the HIV status of the source is not known, a rapid test (order as post exposure HIV) can be performed on blood drawn from the source at the main laboratory (or ER after hours). The post exposure HIV should be drawn in a purple top tube. If positive, the Infectious Disease Watch should be notified as above. If the source is unknown, the Infectious Disease Watch can be consulted for further guidance.
5. The Hepatitis B Surface Antibody, Hepatitis B Surface Antigen, Hepatitis C Antibody, and ALT status of the source person should be also be determined. Recommendations for Hepatitis B prophylaxis are located on the back of this document. Currently, there is no recommendation for Hepatitis C prophylaxis.
6. Both active duty and civilian employees will be followed in Occupational Health. Contract workers will be contacted by Occupational Health to educate them on their need to follow-up with their private physician and to provide them the results on the "source'. See " Instructions for Contractors and Civilians choosing treatment from PMD.

TREATMENT PROTOCOL

- This protocol will be used to document the treatment provided by Occupational Health. The Occupational Health Nurse or Occupational Health provider will initiate the protocol.
- A history will be taken from the exposed individual. Hepatitis B Immune status should be transcribed from the individual's medical record if available. If not, take verbal recollection from patient until confirming titers can be obtained.
- The Occupational Health Nurse will have the authority to order laboratory tests and immunizations as indicated by patient status. If HBIG is indicated, a physician's order is required.
- Initial each ☐ for assessment or intervention performed. Initial and sign the "Signature Identification" table.
- Document all variances from the protocol under "remarks" or on an SF600.

EXPOSURE INFORMATION

DATE/TIME OF EXPOSURE:

TYPE OF EXPOSURE (*i.e., Needle stick, Instrument, Blood/Body Fluid Splash*):

NAME OF SOURCE (*If known*):	LAST 4 DIGITS OF SSN OF SOURCE (*If known):*
SOURCE CONTACT TELEPHONE NUMBERS: (HOME): (WORK): (CELL):	

	INITIAL VISIT	1WK POST EXPOSURE	6 WEEKS POST EXPOSURE	3 MONTHS POST EXPOSURE
DATE/PLACE:				
"EXPOSURE" HISTORY & IMMUNE STATUS *Refer all significant findings to an OM provider and explain here or on SF600.*	VITAL SIGNS: B/P: P: T: HT: WT: PAIN ASSESSMENT (Scale 0-10): ☐ PT. HISTORY Heart condition ☐YES ☐NO TYPE: Liver Disease ☐YES ☐NO TYPE: Immune problems ☐YES ☐NO TYPE: Possibly pregnant ☐YES ☐NO LMP: Completed Hepatitis B vaccine series? ☐YES ☐NO Date of last dose: # of doses received: Previous HBsAB titer done? ☐YES ☐NO Date: Results ☐POS ☐NEG Titer: Previous HIV done? ☐YES ☐NO Date: Results ☐POS ☐NEG Last Tetanus immunization/date: Source HIV Pos: ☐YES ☐NO Was Pt. Already seen by Infectious Disease? ☐YES ☐NO	Any complications since initial exposure? ☐YES ☐NO Explain:	SYMPTOMS HISTORY: Swollen glands ☐YES ☐NO Sore Throat ☐YES ☐NO Fever>100°F ☐YES ☐NO Unusual fatigue ☐YES ☐NO Pain in muscles or joints ☐YES ☐NO Rash ☐YES ☐NO Night sweats ☐YES ☐NO Unexpected weight loss ☐YES ☐NO N/V/D ☐YES ☐NO Headaches ☐YES ☐NO Change in taste or smell ☐YES ☐NO Jaundice ☐YES ☐NO Abdominal pain ☐YES ☐NO Change in color of urine/feces ☐YES ☐NO	SYMPTOMS HISTORY: Swollen glands ☐YES ☐NO Sore Throat ☐YES ☐NO Fever>100°F ☐YES ☐NO Unusual fatigue ☐YES ☐NO Pain in muscles or joints ☐YES ☐NO Rash ☐YES ☐NO Night sweats ☐YES ☐NO Unexpected weight loss ☐YES ☐NO N/V/D ☐YES ☐NO Headaches ☐YES ☐NO Change in taste or smell ☐YES ☐NO Jaundice ☐YES ☐NO Abdominal pain ☐YES ☐NO Change in color of urine/feces ☐YES ☐NO
"SOURCE" DATA	**KNOWN SOURCE** ☐YES ☐NO Was source information obtained ☐YES ☐NO **Review Lab results-If POS, Notify Infect. Disease** HIV-Date: ☐POS ☐NEG HBsAG-Date: ☐POS ☐NEG HCVAB-Date: ☐POS ☐NEG	☐ Review any outstanding lab results	☐ None	☐ None
TEST (EXPOSED PT)	☐ HIV (with informed consent if not active duty) ☐HBsAG ☐HBsAB ☐ HCVAB ☐ALT	☐Review lab results ☐All "source" data negative, no further follow-up required.	☐ HIV ☐ HCVRNA (if "source" was HCV +) ☐ Other	☐ HIV ☐ HCVAB ☐ ALT
ASSESSMENT	☐ Potential exposure to blood borne pathogen	☐ Review lab results ☐ Evidence of Hepatitis? ☐Yes ☐ No ☐ Evidence of HIV? ☐Yes ☐ No If yes, consult required	☐ Review lab results ☐ Evidence of Hepatitis? ☐Yes ☐ No ☐ Evidence of HIV? ☐Yes ☐ No If yes, consult required	☐ Review lab results ☐ Evidence of Hepatitis? ☐Yes ☐ No ☐ Evidence of HIV? ☐Yes ☐ No If yes, consult required
IMMUNIZATIONS (See recommendation on back page)	☐ HBIG (.06ml/kg body wt. IM/5ml max) ☐ Hepatitis B Vaccine (1ml IM deltoid) HBsAB titer one month after immunization ☐ TD (.5ml IM) ☐ Other	☐ HBIG (.06ml/kg body wt. IM/5ml max) ☐ Hepatitis B Vaccine (1ml IM deltoid) HBsAB titer one month after immunization	☐ None required	☐ Hepatitis B Vaccine (1ml IM deltoid) HbsAB titer one month after immunization
CONSULTS		☐ Infectious Disease ☐ Gastroenterology ☐ Other	☐ Infectious Disease ☐ Gastroenterology ☐ Other	☐ Infectious Disease ☐ Gastroenterology ☐ Other
PT. EDUCATION	☐ InitialTeaching Plan (back of guideline)	☐ Review teaching plan	☐ Review teaching plan	☐ Review teaching plan
PT. FOLLOW-UP	☐ Set date for next visit:	☐ Date of next visit:	☐ Date of next visit:	☐ Date of next visit:
REMARKS		☐ No show/missed f/u ☐ Other (see SF 600)	☐ No show/missed f/u ☐ Other (see SF 600)	☐ No show/missed f/u ☐ Other (see SF 600)

	6 MONTHS POST EXPOSURE	1 YEAR POST EXPOSURE (only if source is positive for HIV and HCV)	ADDITIONAL HISTORY/REMARKS/COMMENTS				
DATE/PLACE:					SIGNATURE		
"EXPOSURE" HISTORY & IMMUNE STATUS *Refer all significant findings to an OM provider and explain here or on SF600.*	SYMPTOMS HISTORY: Swollen glands ☐YES ☐NO Sore Throat ☐YES ☐NO Fever>100° F ☐YES ☐NO Unusual fatigue ☐YES ☐NO Pain in muscles or joints ☐YES ☐NO Rash ☐YES ☐NO Night sweats ☐YES ☐NO Unexpected weight loss ☐YES ☐NO N/V/D ☐YES ☐NO Headaches ☐YES ☐NO Change in taste or smell ☐YES ☐NO Jaundice ☐YES ☐NO Abdominal pain ☐YES ☐NO Change in color of urine/feces ☐YES ☐NO	SYMPTOMS HISTORY: Swollen glands ☐YES ☐NO Sore Throat ☐YES ☐NO Fever>100° F ☐YES ☐NO Unusual fatigue ☐YES ☐NO Pain in muscles or joints ☐YES ☐NO Rash ☐YES ☐NO Night sweats ☐YES ☐NO Unexpected weight loss ☐YES ☐NO N/V/D ☐YES ☐NO Headaches ☐YES ☐NO Change in taste or smell ☐YES ☐NO Jaundice ☐YES ☐NO Abdominal pain ☐YES ☐NO Change in color of urine/feces ☐YES ☐NO					
"SOURCE" DATA	☐ None	☐ None			INITIALS		
TEST (EXPOSED PT)	☐ HIV ☐ HCVAB ☐ Other	☐ HIV ☐ HCVAB ☐ HBsAB (Required post Hep B vaccine series) ☐ Other			SIGNATURE		
ASSESSMENT	☐ Review lab results ☐ Evidence of Hepatitis? ☐Yes ☐ No ☐ Evidence of HIV? ☐Yes ☐ No If yes, consult required	☐ Review lab results ☐ Evidence of Hepatitis? ☐Yes ☐ No ☐ Evidence of HIV? ☐Yes ☐ No If yes, consult required					
IMMUNIZATIONS (See recommendation on back page)	☐ Hepatitis B Vaccine (1ml IM deltoid) HbsAB titer one month after immunization	☐ None			INITIALS		
CONSULTS	☐ Infectious Disease ☐ Gastroenterology ☐ Other	☐ Infectious Disease ☐ Gastroenterology ☐ Other			SIGNATURE		
PT. EDUCATION	☐ Review teaching plan	☐ Review teaching plan					
PT. FOLLOW-UP	☐ Date of next visit:	☐ Date of next visit:					
REMARKS	☐ No show/missed f/u ☐ Other (see SF 600)	☐ No show/missed f/u ☐ Other (see SF 600)					

TEACHING PLAN

PATIENT INFORMATION (HANDOUTS REVIEWED & PROVIDED)	DATE & INITIALS	DATE & INITIALS	DATE & INITIALS	DATE & INITIALS	DATE & INITIALS	DATE & INITIALS
1. Patient Guide to Post Exposure Evaluation						
2. Information following Exposure						
3. Condom Use						
4. Discussed safer sex precautions.						
5. Discussed signs and symptoms to report.						
6. Discussed safety measures to prevent re-exposure.						
7. Discussed side effects of immunizations.						
8. Discussed date and time of follow-up appointments and the importance of follow-up appointments.						
9. Provided Health Care Professional's Written Opinion; signed statement below						
10. Signed Confidentiality of Disclosure statement below						

CONFIDENTIAILITY OF DISCLOSURE

As a result of your exposure to blood or body fluids, the possibility of exposure to Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV) exists. Federal law requires that you be informed of the presence of these infections in the person who was the source of your exposure, if that information is available. State and Federal law also require that you maintain the confidentiality of that information. Therefore, you must avoid unauthorized disclosure of the name, identifying data, or infectious status of the individual whose blood or body fluids was the source of your exposure.

I ACKNOWLEDGE UNDERSTANDING OF THE ABOVE STATEMENT AND RECEIPT OF THE SIGNED FORM

EXPOSED INDIVIDUAL'S SIGNATURE:	DATE:	HEALTHCARE PROVIDER'S SIGNATURE:	DATE:

HEALTHCARE PROFESSIONAL'S WRITTEN OPINION

The employer shall provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 day of the completion of the evaluation. The healthcare professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following:

- Written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.
- The employee has been informed of the results of the evaluation.
- The employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

I ACKNOWLEDGE UNDERSTANDING OF THE ABOVE STATEMENT AND RECEIPT OF THE SIGNED FORM

EXPOSED INDIVIDUAL'S SIGNATURE:	DATE:	HEALTHCARE PROVIDER'S SIGNATURE:	DATE:

RECOMMENDATIONS FOR HEPATITIS B PROPHYLAXIS

EXPOSED PERSON	Source: HBsAg positive	Source: HBsAg negative	Source: Not tested or unknown
UNVACCINATED	HBIG * x 1 and initiate HB vaccine	Initiate HB vaccine	Initiate HB vaccine
PREVIOUSLY VACCINATED (KNOWN RESPONDER)	No treatment	No treatment	No treatment
KNOWN NON-RESPONDER	HBIG x 2 or HBIG x 1 and initiate revaccination	No treatment	If known high-risk source, treat as if source were HBsAG positive
RESPONSE UNKNOWN	Test exposed person for anit-HBS 1. If adequate **, no treatment. 2. If inadequate, HBIG x 1 and vaccine booster.	No treatment	Test exposed person for anit-HBS 1. If adequate **, no treatment. 2. If inadequate, HBIG x 1 and vaccine booster.

HBIG dose 0.06mg/kg/IM* **Adequate anti-HBs is ≥10SRU by RIA or positive EIA*

References: MMWR Morbidity and Mortality Report, US Department of HHS/CDC, June 29, 2001/Vol 50/ No. RR-11
Dept of Labor Regulations, Standards-29CFR, Bloodborne pathogens.-1910.1030

Injury Care/Post Exposure Prophylaxis/Follow-up

- If the source is positive for HCV, get a six week HCV RNA test
- 6 month labs are very important to obtain for medicolegal purposes
- 1 year labs should be considered in sources positive for HIV and HCV

Workers' Compensation Case Scenario #1

- 52 y/o white female lab worker who has a chronic hepatitis C infection since the mid 90s
- Files a claim for workers' compensation (WC) stating by working with hepatitis/ HIV blood specimens she contracted the disease.
- No documented needlestick at place of work.

Workers' Compensation Case Scenario #1

- On work history, patient reports she had a needlestick at another institution in the late 1980s.
- Unable to obtain documentation from other institution regarding needlestick incident and work-up

Workers' Compensation Case Scenario #1

- Controverted claim since worker denies any needlestick at present work site since 1993.
- OWCP accepted claim but has so far made no payments as worker is being followed at another Federal health agency for her liver disease and she has had no loss work time

Workers Compensation Case Scenario #2

- 35 y/o female nurse who on accidental testing for BBP program at another hospital was found to be Hepatitis C positive.
  - Nurse works in dialysis and claims she was infected when she worked at your hospital two years previously
  - Documented bloodborne pathogen exposure to a known hepatitis C patient

Workers Compensation Case Scenario #2

- Documentation at your hospital shows nurse only did the initial and six week follow-up lab tests which were negative for HIV and Hepatitis C & B
- Nurse was instructed to follow-up at three and six months for labs at the time of the initial visit and given a reminder card

Workers Compensation Case Scenario #2

- She was not contacted any further to remind her about needed follow-up
- The nurse left your hospital three months after the incident
- At time of filing claim, the nurse denied any risk factors for hepatitis C infection outside of the workplace setting (IV drug abuse, etc.)

Workers Compensation Case Scenario #2

- Given the case scenario, does the structure of HCV allow one to use genetic sequencing to see if the viruses uniquely match one another in the source and exposed person?
- The answer is a general **no** since HCV is genetically changing all the time.

HCV Testing: Implications for Workers Compensation

- HCV is a spherical, enveloped, single-stranded RNA virus belonging to family Flaviviridae.
- In persons who are infected, HCV may produce approximately a trillion new viral particles each day in a steady state of viral replication.

http://hepatitis-central.com/hcv/hepatitisc.html

HCV Testing: Implications for Workers Compensation

- The RNA-dependent RNA polymerase, an enzyme critical in HCV replication, lacks proofreading capabilities and thus generates a large number of mutant viruses known as quasispecies.
- Viral quasispecies represent minor molecular variations with only 1-2% nucleotide heterogeneity.

http://hepatitis-central.com/hcv/hepatitisc.html

HCV Testing: Implications for Workers Compensation

- At this time there is no method to determine the RNA sequence of the source and the exposed HCV and be able to backtrack to see if at one time they were a match
  - RIBA test is only a confirmatory for the presence of more specific areas of the HCV antigen
- HCV Genotype
  - Used mainly in treatment decisions
  - Limited usefulness in excluding link between possible source and patient

HCV Testing: Implications for Workers Compensation

- Six major HCV genotypes and numerous subtypes have been identified based on molecular relatedness.
- Molecular differences between genotypes are relatively large, and they have a difference of at least 30% at the nucleotide level.
- Genotypes 1, 2, and 3 have a worldwide distribution,

HCV Testing: Implications for Workers Compensation

- Genotypes 4, 5, and 6 are localized to specific geographic locations.
- Genotype 1 is the most common genotype in the United States. HCV genotype 1, particularly 1b, does not respond to therapy as well as genotypes 2 and 3.

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Workers Compensation Case Scenario #2

- Genotype of source and exposed nurse were the same-1a
- However, given that 70% of all patients with HCV in the US have this genotype, it really did not prove an association
- OWCP still rejected this patient's claim even though exposure to a positive HCV patient was well documented

Sharps Injury Prevention: Key Points of Program Operation Processes

- Five processes support a sharps injury prevention program
- A baseline assessment of these processes is necessary for effective program planning
- Areas for review include:
  - Assessment of the Culture of Safety
  - Procedures for sharps injury reporting
  - Analysis and use of sharps injury data
  - Systems for selecting, evaluating and implementing safety devices
  - Programs for the education and training of healthcare personnel on sharps injury prevention

http://www.cdc.gov/sharpssafety/workbook.html

Step 6 - Monitor Performance Improvement
Step 5 - Develop and Implement Action Plans
Step 4 - Determine Intervention Priorities
Step 3 - Prepare Baseline Profile of Injuries and Prevention Activities
Step 2 - Assess Program Operation Processes
Step 1 - Develop Organizational Capacity

http://www.cdc.gov/sharpssafety/workbook.html

Current Prevention Approaches

- *hierarchy of controls* concept used by the industrial hygiene profession to prioritize prevention interventions.
- **Alternatives to Using Needles (substitution)**
- **Engineering Controls (i.e. needleless devices)**
- **Work-practice Controls (Universal precautions)**
- **Administrative controls (safety citations)**
- **Personal protective equipment (PPE)**

Sharps Injury Prevention

- Using instruments, rather than fingers, to grasp needles, retract tissue, and load/unload needles and scalpels;
- Giving verbal announcements when passing sharps;
- Avoiding hand-to-hand passage of sharp instruments by using a basin or *neutral zone;*
- Using alternative cutting methods such as blunt electrocautery and laser devices when appropriate;

http://www.cdc.gov/sharpssafety/workbook.html

Sharps Injury Prevention

- Substituting endoscopic surgery for open surgery when possible; and
- Using round-tipped scalpel blades instead of sharp-tipped blades.
- The use of blunt suture needles, an engineering control, is also shown to reduce injuries in this setting. These measures help protect both the healthcare provider and patient from exposure to the other's blood.

http://www.cdc.gov/sharpssafety/workb

References/Resources

- http://www.cdc.gov/sharpssafety/workbook.html
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